

**WASTE ASSEMBLY ALLOWING ADJUSTABLE FITMENT OF A
FLOOR WASTE OR APPLIANCE**

The present invention relates to drainage apparatuses and more particularly to a waste assembly for use with waste generating appliances and as a surface drain including a reservoir which accommodates a floor waste or waste discharge line from an appliance in a selected location within the periphery of the reservoir.

PRIOR ART

There are in existence a wide variety of surface drains and floor wastes and waste outlets associated with appliances which link directly or indirectly with plumbing infrastructure in a building. These are found in public and private installations alike and are usually positioned at a low point in the drainage network. Generally in the case of floor drains and wastes these include a grate which finishes the assembly and allows ingress of surface waste water.

One such floor waste is disclosed in German specification DE 4115638. This document discloses a metal drain gutter inserted in a concrete or plaster floor and includes a grill which covers the opening but allows the waste water to enter the gutter. This floor waste includes a well or receptacle defined by a profiled structure including shoulder regions which receive the grate.

Usually, floor wastes are positioned to align with under floor plumbing so there is a significant predetermined restriction on the scope of available movement of above floor fittings to accommodate the position of plumbing and floor cladding such as floor tiling. As floor wastes and appliances must traditionally be fitted in with floor cladding this usually requires an adjustment of the grate or appliance outlet particularly where tiles and

the like are used (as is common in wet areas) to suit the floor cladding. Adjustment of the waste or appliance outlet to match drainage plumbing infrastructure has in the past been inhibited once underfloor drainage plumbing is in place as there is almost no flexibility in positioning of above floor waste generating appliances or floor wastes.

According to prior art methods an installer has two main options for symmetric installation of floor tiles particularly with the inherent restriction of non adjustability of floor grates. The first alternative involves setting the tiles to room dimensions in which case desired alignment with the grate may be a matter of luck or may not occur. The second involves setting the tiles to suit the position of the grate in which case the fit to the room layout is sacrificed.

According to the prior art the final position of a floor waste is dictated by the underfloor plumbing infrastructure , but the floor cladding must then be adjusted to suit the waste position which can often result in less than aesthetically pleasing results . In conventional drains the inlet orifice (or grate) is substantially in alignment with the drainage pipe and it is this requirement which dictates the final position of the grate.

Another prior art surface drain is disclosed in U S patent 2182 795 . This patent teaches a waste having a wide mouthed waste water receiving receptacle described as a drain body which accommodates a removable grate on a continuous recessed retaining step in the drain body . The drain body is sized to also receive a removable strainer bucket which catches debris and enabling periodic cleaning of the drain as well as preventing debris entering the drain system . As with most known floor waste arrangements , the positioning of this waste and more particularly the grate is dictated by the set position of the plumbing

infrastructure underneath .

U. K. patent specification 1208 833 discloses a fluid waste gulley including a hopper which collects drainage water via top members which might be a grate or plate with an inlet orifice which seat on a ledge on the hopper . The grate or inlet plate disclosed in that patent have their floor positions dictated by the configuration and position of the hopper. However the arrangement described in this patent is directed primarily to the provision of a gulley adaptable to various layouts in rainwater and surface water systems. The top members of the gully assembly are not intended as flooring and the assembly itself is primarily intended for stormwater and surface water. The arrangement described in that patent allows interchangeability of two top members but is not intended as a waterproofing solution. Nor does it teach versatility of fitment at the distal end of a downpipe. In fact the disclosure teaches away from the present invention. For instance, the disclosure teaches interchangeable members creating alternative layouts.

Furthermore, the arrangement described in the UK patent is directed to an objective entirely different from that of the present invention in all its forms.

Thus , in the prior art floor waste arrangements there is almost no flexibility as to the location of the grate once the underfloor plumbing infrastructure is set and this is usually completed first.

This absence of flexibility means that a waste or appliance can only be located where it will align with an inlet to the main drainage plumbing and that subsequent work such as floor tiling must accommodate the waste or appliance outlet in that the tiling patterning is in most cases interrupted such that the result is aesthetically unacceptable.

INVENTION

The present invention seeks to overcome the aforesaid difficulties inherent in the prior art by providing an assembly for receiving a floor grate or waste generating appliance outlet allowing selective positioning of a grate associated with the assembly such that whilst the plumbing infrastructure may be pre-set the installer of the assembly has significant flexibility in the positioning of the grate or outlet of an appliance within the limits of the mouth of the assembly.

This allows floor cladding such as tiles to be located according to a selected pattern and not dictated by the positioning of the grate. Thus the grate can be positioned selectively to accommodate tile joins by avoiding them altogether or intersecting with them. This also allows selective positioning of a waste generating appliance or floor grate without requiring alignment between said grate or appliance outlet and an inlet to drainage plumbing infrastructure.

The present invention also seeks to provide an alternative grate assembly suitable for use with the above waste assembly.

According to another aspect, the present invention provides a waste body for use with an assembly for receiving a floor grate or waste generating appliance outlet which connects with an inlet to drainage plumbing in a building; thereby obviating the necessity for the floor grate or outlet of said appliance to align with said inlet.

In one broad form the present invention comprises a floor or ground surface waste assembly including ; a waste body having a waste collecting receptacle; the receptacle including an open mouth for receiving waste products from a floor grate or appliance; an

selective positioning of said grate or appliance outlet obviates the necessity for said appliance outlet or grate to align with or be directly connected to said outlet or an inlet of underfloor drainage plumbing.

These arrangements have the added advantage of preventing unwanted interruption to a predetermined floor cladding pattern , layout or configuration . Preferably the grate or appliance outlet may be selectively positioned to avoid or alternatively intersect with a join or joins in said floor cladding .

In another form the present invention comprises; a waste body for use with an assembly for collection and discharge of waste from a waste generating appliance or floor waste, the waste body comprising an open mouth reservoir for receiving said waste and including an outlet for discharging said waste received in said reservoir, the waste body further including a bearing surface which receives an insert proportioned to cover said mouth , the insert adapted to receive a grate or outlet of a waste generating appliance positioned in the insert such that the outlet of the waste body connects to and aligns with an inlet to underfloor drainage plumbing; wherein the dimension of said mouth is such that said grate or appliance outlet need not align with said inlet to said underfloor plumbing thereby allowing flexibility in the positioning of said floor grate or appliance within the limits of a periphery of said waste body.

Preferably, the insert is set in the waste body with clearance for seepage via said shoulder

In another form the present invention comprises: a waste assembly for receiving and discharging waste from a waste producing appliance , surface drain or the like in communication with the assembly ; the assembly including ; a waste body having an open

mouth defining a recess for receiving said waste , and an outlet capable of connection to an inlet of drainage plumbing infrastructure allowing discharge of said waste ; a closure member supported by the waste body for closing said mouth and which receives said surface drain or an outlet of said waste producing appliance ; wherein the closure is proportioned such that an installer of said surface drain or outlet of said appliance may position said drain or appliance outlet at any selected position bounded by the periphery of said waste body thereby obviating the need for direct connection and /or axial alignment between said surface drain or appliance outlet and said plumbing infrastructure.

In another broad form the present invention comprises:

a waste assembly for connecting an appliance outlet or floor drain to plumbing infrastructure of a building; the waste assembly comprising; a waste body having a wide mouth and defining a reservoir which includes an outlet which connects said waste body to said plumbing infrastructure , a shoulder region over said waste body for receiving a closure member closing said mouth and which receives via an opening formed therein an appliance outlet or floor drain; wherein said closure member is of sufficient area to allow a selection of the position of said appliance outlet or drain anywhere within the area defined by the periphery of the waste body such that the position in the closure of the appliance outlet or floor drain is not dictated by direct axial alignment of said appliance outlet or floor drain with said plumbing infrastructure.

Preferably, the closure member sits proud of said shoulder on projections thereon and forms part of floor structure.

In another form the present invention comprises: a grate assembly comprising:

a retaining body which engages and is supported by flooring into which the grate assembly is inserted; a releasable cover retained in said retaining body and which allows waste to flow along and about a surface of said cover; a perforated strainer plate which allows passage of waste; an overflow tower which receives said waste in the event of blockage of said perforated strainer plate; wherein removal of said releasable cover allows access to said strainer for cleaning purposes.

According to one embodiment, the grate assembly is clamped with a lock nut to a prefabricated shower tray. In another embodiment the assembly is set in an adhesive or cementitious material. A thread on an outer surface of the retaining body facilitates anchorage of the assembly. Preferably, the closure comprises a roof including a contoured surface conducive to drainage and leg members supporting said roof and which engage a recess in said retaining body. Preferably, said legs bear on an upper surface of said strainer plate and are releasable from said recess in said retaining body by rotation .

Preferably removal of said cover allows access to said upper surface of said strainer plate for cleaning purposes.

Preferably, said overflow tower comprises a cylindrical body of predetermined height which terminates short of an underside of said cover. Said overflow tower operates in the event that debris blocks perforations on said strainer plate.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION.

The present invention will now be described in more detail according to a preferred but non limiting embodiment and with reference to the accompanying drawings wherein;

Figure 1 shows a perspective view of a preferred embodiment of a waste body for use in

Figure 1 consists of 12 line graphs (a-l) showing the time course of various parameters during the first 24 hours of reperfusion after 2 hours of ischemia. The graphs are arranged in a 6x2 grid. The left column (a, c, e, g, i, k) shows parameters for the control group (n=10), and the right column (b, d, f, h, j, l) shows parameters for the reperfusion group (n=10). The x-axis for all graphs is 'Time (h)' from 0 to 24. The y-axis for all graphs is 'Mean ± SEM'.
 (a) Core temperature (°C) starts at ~37.5, drops to ~36.5 at 2h, and recovers to ~37.5 by 24h.
 (b) Core temperature (°C) starts at ~37.5, drops to ~36.5 at 2h, and recovers to ~37.5 by 24h.
 (c) Core temperature (°C) starts at ~37.5, drops to ~36.5 at 2h, and recovers to ~37.5 by 24h.
 (d) Core temperature (°C) starts at ~37.5, drops to ~36.5 at 2h, and recovers to ~37.5 by 24h.
 (e) Core temperature (°C) starts at ~37.5, drops to ~36.5 at 2h, and recovers to ~37.5 by 24h.
 (f) Core temperature (°C) starts at ~37.5, drops to ~36.5 at 2h, and recovers to ~37.5 by 24h.
 (g) Core temperature (°C) starts at ~37.5, drops to ~36.5 at 2h, and recovers to ~37.5 by 24h.
 (h) Core temperature (°C) starts at ~37.5, drops to ~36.5 at 2h, and recovers to ~37.5 by 24h.
 (i) Core temperature (°C) starts at ~37.5, drops to ~36.5 at 2h, and recovers to ~37.5 by 24h.
 (j) Core temperature (°C) starts at ~37.5, drops to ~36.5 at 2h, and recovers to ~37.5 by 24h.
 (k) Core temperature (°C) starts at ~37.5, drops to ~36.5 at 2h, and recovers to ~37.5 by 24h.
 (l) Core temperature (°C) starts at ~37.5, drops to ~36.5 at 2h, and recovers to ~37.5 by 24h.

be chosen according to the location and attitude of the drainage plumbing inlet to which the waste body will be attached. Body 1 further comprises a shoulder 8 including a bearing surface 9 bounded by peripheral wall 10 terminating in peripheral flange 11. Waste body 1 may be any one of a variety of shapes such as but not limited to circular, triangular or rectangular according to design requirements. Also waste body 1 may be set into concrete or a sand bed.

Referring to Figure 2 there is shown a cross sectional view of a waste assembly 12 according to a preferred embodiment incorporating the waste body 1 of Figure 1.

Waste body 1 is shown located in an opening 13 in floor stratum 14 and engages floor surface 15 via peripheral flange 11. Underside surface 16 of shoulder 8 bears on surface 16 of support member 17 providing increased stability. Waste body 1 receives via bearing surface 9 insert 18 which spans the gap defined by peripheral wall 10 closing mouth opening 3 to waste body 1 but with clearance for seepage between said insert 18 and shoulder 8. Insert 18 acts as part of flooring and provides a bearing surface 19 for cladding which may typically comprise floor tiles 20 laid over an adhesive, waterproof membrane or cement render 21. Due to the area of insert 18 an installer of a grate or appliance outlet has flexibility as to the location in insert 18 of the grate or outlet which might ideally be positioned in an opening 22 to either intersect with or avoid joins in tiles 20. Waste assembly 12 of figure 2 further comprises according to one embodiment grate assembly 23 which locates in opening 22 of floor insert 18.

Grate assembly 23 includes grate body 24 preferably defining a cylindrical wall and includes shoulder 25 having a bearing surface 26 which releasably receives and supports

Pre-treatment

10 days

Blood sample

Blood count
Blood chemistry
Blood coagulation
Blood cell morphology

Treatment

10 days

Blood sample

Blood count
Blood chemistry
Blood coagulation
Blood cell morphology

Post-treatment

10 days

Blood sample

Blood count
Blood chemistry
Blood coagulation
Blood cell morphology

In an alternative arrangement, the grate position can be selected to fall within the periphery of a tile . Similarly, with other forms of wet area cladding the grate position can

Figure 1 consists of 12 histograms arranged in a single column. Each histogram represents the frequency distribution of the number of non-zero elements in the vector x for a specific value of n . The x-axis for all histograms is labeled 'x' and ranges from 0 to 120. The y-axis is labeled 'Frequency' and ranges from 0 to 100. The histograms are for $n = 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120$. As n increases, the distribution of non-zero elements shifts to the right, indicating that more elements in the vector x are non-zero for larger n . The peak frequency of the distributions decreases as n increases.

12

that there would be at least one screw per side of the waste body or where a shape other than square or rectangular is adopted such as circular or elliptical one fastener every 150 mm in most installations would suffice. Alternatively, to avoid cracking of plastic due to fastener restraint, fasteners need not penetrate flange 11. Once waste body 1 is in position the final connection may be made to an inlet of a drainage line (not shown) which will engage one or both of outlet pipes 4 or 6 spigot 4a may be fitted to outlet 4 of waste body 2 enabling a support flange to be glued on stabilising waste body 2 and locking it into concrete where used with provision for a collar allowing height adjustment. Following that operation is the installation of insert 18. Then a selection is made for the position in insert 18 of grate assembly 23 comprising wall 24 which terminates in an upper shoulder 25 extending peripherally about said wall to receive grate insert 27 according to conventional methods of assembly.

Waste body 1 is preferably constructed of a plastics material such as PVC or ABS generated in a mold but may also be formed from a metallic or other suitable material.

Referring to figure 3 there is shown a cross sectional elevation of a waste body 35 according to an alternative embodiment.

As previously described, the waste assembly of the present invention may be used with a floor waste assembly or a waste producing appliance which typically might be a toilet pan. Traditionally, the installation of a toilet pan necessitated accurate positioning so that pan outlet will be in alignment with an inlet to a drainage network which usually preceeds the installation of the appliance. Waste body 35 due to its unique configuration allows an installer of an appliance flexibility with respect to positioning of the waste outlet. More

particularly, the appliance outlet need not be in perfect alignment with an inlet to drainage infrastructure. This overcomes fitting problems which can arise in tight spaces or where an appliance is required to accommodate floor cladding for an optimum aesthetic result. The waste also eliminates the problem of force fitting or fudging to ensure an appliance outlet aligns with a drainage line inlet.

According to the embodiment of figure 3 waste body 35 includes reservoir 36 which receives waste via an opening 37 in closure 40. Alternatively, closure 40 may be moulded or cast in plastic or metal and may be glued into a shoulder at the periphery of the waste body.

Closure 40 may be formed in the shape of a cap with a peripheral flange. This closure may be used for appliance discharge from such items as a toilet pan, bath or premade storage tray into which the pan collar, shower or bath waste outlet is attached such that the system is closed preventing odours or back wash. In an alternative embodiment, waste body 35 may be more steeply sloped (bowl shaped) to allow for easier passage of heavier waste such as from a toilet pan. This will result in waste body 35 having an annular wall 48b terminating in an annular flange 48c.

The closure 40 may be used where there will be no applied floor loads such as at the rear of a toilet pan or under a bath or prefabricated shower. The cap may also be glued in upside down and filled with concrete or other filler in the event the waste body is subject to floor loads.

Reservoir 36 terminates in outlet 38 which will be connected to an inlet 39 to underfloor drainage plumbing. Closure 40 which is preferably a glue-on moulded plastics lid

engages peripheral shoulder 41 and seals reservoir 36. Closure 40 receives adaptor 42 which facilitates connection of a toilet pan outlet 45 to waste body 35 via opening 43 bounded by collar 44.

Closure 40 may be fabricated from plastics such as PVC plastics or other suitable material. Referring to figure 4 there is shown a perspective view of the arrangement of figure 3 with corresponding numbering.

Figure 5 shows an alternative waste assembly 46 this time with side outlet 47 attached to waste body 48. Outlet 47 engages a side inlet 49 which eventually leads to waste drainage plumbing. Waste assembly 46 otherwise operates in a similar manner to that described for waste body 35. Figure 6 shows a perspective view of the waste body of figure 5 with corresponding numbering.

Referring to figure 7 there is shown a grate assembly 50 according to a preferred embodiment providing an alternative to that shown in figure 2.

Grate assembly 50 comprises peripheral retaining body 51 which engages an opening in a floor structure or floor member and is axially retained by flange 52. Preferably engagement between body 51 and said floor structure is facilitated by an external thread 51a. External thread 51a ideally assists with bonding to floor surface material such as cement, adhesives and the like to prevent unwanted dislodgement. Preferably, a lock nut is screwed into thread 51a of retaining body 51. Body 51 is sealed against a locking nut 53 by O ring 54 to prevent ingress of floor waste between locking nut 53 and body 51.

Peripheral body 51 may be set into and flush with floor cladding such as tiles or may be fitted to a pre fabricated shower tray (not shown). There are two main alternatives for

fitting peripheral body 51. The first involves use of a lock nut and O ring used preferably in shower tray installations. The second alternative body 51 is set in a tiled or cement surface. In this case thread 51a provides a roughened surface which keys into the cement thereby avoiding prior art bonding defects.

Peripheral body 51 may be injection molded or cast. As the peripheral body 51 is sealed by locking nut 53 this will prevent leakage of waste water between the floor or shower tray and the grate assembly.

Grate assembly 50 further comprises removeable cover 54 which locates in an opening 55 in peripheral body 51. Cover 54 further comprises flanges 56 and 57 which engages respective recesses 58 and 59 of peripheral body 51 to lock cover 54 into position. Upper surface 60 of cover 54 is cambered radially allowing a slight fall from the centre of upper surface 60 to peripheral region 63. Cover 54 further includes legs 61 and 62 each terminating in respective flanges 56 and 57. The attitude of legs 61 and 62 results in the formation of an annular recess 64 between legs 61 and 62 and peripheral body 51.

Radiused curve 65 facilitates passage of waste water into recess 64. Openings between legs 61 and 62 allow passage of waste water therebetween. Grate assembly 50 further comprises strainer plate 66 which seats on shoulder 67 of peripheral body 51.

Legs 61 and 62 seat on upper surface 73 of strainer plate 66. Strainer plate 66 further comprises openings 70 through which waste water flows and an overflow tower 71 which includes handle 72 for easy removal. In use, waste water entering gap 64 eventually impacts on plate 66 and penetrates openings 70. In the event debris collects on plate 66 sufficient to block passage of waste water through openings 70 the waste water will be

discharged via overflow tower 71 into a waste pipe which is part of plumbing infrastructure. Where this build up occurs, cover 54 may be removed by rotational displacement of the flanges 56 and 57 of legs 61 and 62 away from peripheral recess 58 whereupon debris on strainer plate 66 can be accessed and removed thereby clearing openings 70. . Legs 61 and 62 as described result in four legs supporting cover 54. As an alternative multiple legs greater than or less than four may be used. As a further alternative a single pedestal support may be employed.

It will be recognised by persons skilled in the art that numerous variations and modifications may be made to the invention as broadly described herein without departing from the overall spirit and scope of the invention.

09601375-092400